NAVAL BASE CORONADO

SAF-T-LINES

AUGUST 2006

HEAT STRESS

Hot Hot Hot Hot Hot Hot Hot Hot Hot Hot

Heat stress can be a serious problem in hot working environments. The core body temperature for a human must be maintained within a very narrow range, regardless of work load or adverse environmental conditions. An increase in core body temperature of 6.5 degrees Fahrenheit above normal can result in death. The body initially responds to heat by sweating and by circulating blood closer to the skin's surface to lower the main body temperature. When exposure to heat takes place over an extended period, a process of physiological adaptation called acclimatization occurs. Acclimatization may take weeks, although significant adaptation occurs within a few days of the first exposure. Once acclimatization is achieved, working in the heat results in increased production of a more dilute sweat and less of an increase in heart rate and body temperature.

HEAT RELATED DISORDERS

HEAT RASH

Heat rash is an early signal of potential heat stress. It is commonly associated with hot, humid conditions in which skin and clothing remain damp due to unevaporated sweat. Heat rash may involve small areas of the skin or the entire torso. Even after the affected area of skin is healed, sweat production will not return to normal for another 4 to 6 weeks. Treatments include cleaning the affected area and applying mild lotions to it. Keeping the skin clean and dry for at least 12 hours each day will prevent severe heat rash.

HEAT SYNCOPE

Heat syncope is characterized by dizziness or fainting while standing still in the heat for an extended period. Heat syncope is the least serious of heat-induced disorders. Its most serious aspect is that it may cause people to fall or injure themselves while operating machinery.

HEAT CRAMPS

Symptoms include painful cramps or spasms in the legs, arms, or abdomen. The victim will probably sweat heavily. Spasms may occur during work or in the evening after work. Heat cramps are often caused by a temporary fluid and salt imbalance during hard physical work in hot environments.

HEAT EXHAUSTION

Heat exhaustion results from the reduction of body water content or blood volume. The condition occurs when the amount of water lost as sweat exceeds the volume of water drunk during the heat exposure. The victim of heat exhaustion may have some or all of the signs or symptoms: heavy sweating; clammy;, flushed or pale skin; weakness; dizziness; nausea; rapid and shallow breathing; headache; vomiting; or fainting.

First-aid treatment for heat exhaustion consists of:

- **Move the victim to a cool area**
- **Place them on their backs with their feet raised**
- **Loosen clothing and apply cool, moist cloths to the body, or fan the victim**
- **Slowly administer sips of salt water (plain water for those with heart or blood pressure problems)**
- **Seek medical attention promptly, especially if the victim faints or vomits**

HEAT STROKE

Heat stroke is a life-threatening, heat-related disorder associated with working under very hot and humid conditions. Heat stroke can result in coma or death. The early signs and symptoms of heat stroke include:

- **A high body temperature, 104 degrees Fahrenheit or over;**
- **Hot, dry skin that appears bluish or red;**
- **Absence of sweat in 50 to 75 percent of victims;**
- **Rapid heart rate;**
- **Dizziness, shivering, nausea, irritability, and severe headache progressing to mental confusion, convulsions, and unconsciousness.**

A worker who becomes irrational or confused or collapses on the job should be considered a heat stroke victim, and medical help should be called immediately. Early recognition of symptoms and prompt emergency treatment is important.

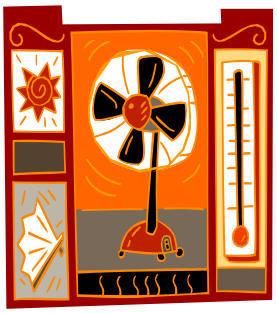
First-aid treatment for heat stroke consists of:

- **Call 911, request an ambulance;**
- **Move the victim to a cooler environment and remove outer clothing;**
- **Wet the skin with water, and fan vigorously or repeatedly apply cold packs or immerse the victim in a tub of cool (not ice) water. If no water is available, fanning will help promote cooling.**

PREVENTING HEAT STRESS

Acclimatization (to heat) is a process of adaptation that involves a stepwise adjustment to heat over a week or sometimes longer. An acceptable schedule for achieving acclimatization is to limit occupational heat exposure to one-third of the work day during the first and second days, one half of the workday during the third and fourth days, and two-thirds of the workday during the fifth and sixth days. The acclimatization procedure must be repeated after days off due to illness or a vacation of one week or more. To achieve acclimation, a person must work in the heat at the activity level required by the job.

Always drink plenty of water when in the heat. Simply relying on feeling thirsty will not ensure adequate hydration. To replace the four to eight quarts of sweat that may be produced in hot environments, people require one-half to one cup of water every 20 minutes of the workday. Water at 55 degrees Fahrenheit is preferable to ice water or warm water.



Limit exposure time. Schedule as many hot activities as practical during the coolest part of the day (early morning or late afternoon). Employ additional help or increase mechanical assistance if possible. Minimize heat exposure by taking advantage of natural or mechanical ventilation (increased air velocities up to 5 mph increase the rate of evaporation and thus the rate off heat loss from the body) and heat shields when applicable.

Take rest breaks at frequent, regular intervals, preferably in a cool environment sheltered from direct sunlight. Anyone experiencing extreme heat discomfort should rest immediately. Wear clothing that is permeable to air and loose fitting. Generally, less clothing is desirable in hot environments, except when a person is standing next to a radiant heat source. Then covering exposed skin is beneficial to reducing heat stress.

Wet-Bulb, Globe Temperature (WBGT) Index

1. **The WBGT Index is the most effective means of assessing the effect of heat stress on the human body. Heat casualties can be expected at WBGT readings of 75 degrees Fahrenheit and above unless preventive measures are instituted. Heavy work can cause heat injury at lower temperature especially if body armor or protective clothing is worn.**

2. **The WBGT Index is a single number derived mathematically from three distinct temperature measurements: wet bulb temperatures, dry bulb temperatures, and globe temperatures. Color coded flags are flown in strategic locations so that all personnel will be aware of the current heat stress index and make appropriate work schedule adjustments.**

    a. **White Flag - WBGT Index is <80. Extremely intense physical exertion may precipitate heat exhaustion or heat stroke; therefore, caution must be taken.**

    b. **Green Flag - WBGT index is between 80 and 84.9. Discretion is required in planning heavy exercise for unacclimatized personnel. This is marginal heat stress limit for all personnel.**

c. **Yellow Flag – WBGT Index is between 85 and 87.9. Strenuous exercise and activity must be curtailed for new and unacclimatized personnel during the first 3 weeks of heat exposure. Outdoor classes in the sun must be avoided when WBGT Index exceeds 85.**

d. **Red Flag – WBGT Index is between 88 and 89.9. Strenuous exercise must be curtailed for all personnel with less than 12 weeks training in hot weather.**

e. **Black Flag – WBGT Index is 90 or above. Physical training and strenuous exercise must be suspended for all personnel. (Excludes operational commitment not for training purposes)**

Quick Primer on Heat Stress Flags

The NAVMED reference that applies to Heat Stress are operationally-oriented, but are also applied to Physical Training/Physical Readiness Test (PT/PRT) activities. The principal reference is the Manual of Naval Preventive Medicine (NAVMED P-5010). Chapter 3, Ventilation and Thermal Stress Ashore and Afloat, addresses heat flag conditions. Table 3-9 (the WBGT Index ranges for each flag condition) establishes guidelines for ashore/afloat operations and "applies especially to personnel during training and recreational exercises in hot weather.

NAVMED P-5010-3 may be downloaded from:
http://www-nehc.med.navy.mil/prevmed/pubstat.htm

From an off-duty perspective, the Recreation and Off-Duty Safety (RODS) program (OPNAVINST 5100.25A) instruction doesn't address heat stress during recreational activities. However, practically speaking, use of these flag conditions across the board makes sense, particularly for outdoor operations, recreational and PT/PRT, where solar heat load is a major factor. The purpose of the flags is not to prevent an acclimated individual from exercising whenever he/she chooses. The intent is to provide commands and MWR facilities with a system to guide when heavy, strenuous operations or command physical training should be curtailed. **It is a risk management tool.**

NAVOSH TRAINING

CPR CERTIFICATION CLASS

Date: 1 August and 5 September 2006
Where: Bldg 678, Classroom 222
Time: 0800 – 1200

Please call Mr. Tom Hirzel at (619) 767-7546 or "E" mail Thomas.hirzel@navy.mil for questions regarding the course. To reserve a seat, fax quota request to 545-1053.

RESPIRATOR TRAINING CLASS

Date: 2 August and 6 September 2006
Where: Bldg. 678, Classroom 222
Time: Respiratory Program Assistant - 0800-1200
Respiratory Protection program (Users) - 1300-1430

Please call Mr. Tom Hirzel at (619) 767-7546 or "E" mail Thomas.hirzel@navy.mil for questions regarding the course. To reserve a seat, fax quota request to 545-1053.

NAVOSH INSPECTION (ANNUAL) SCHEDULE

COMMAND	DATE
NAVY BAND	08 AUG
TACTICAL SUPPORT CENTER	09 AUG
COMHSCWINGGPAC (INCLUDING HSC-3 AND HS-10)	15 AUG
NAVAL AIR RESERVE (NAR)	17 AUG
EXPEDITIONARY WARFARE TRAINING GROUP PACIFIC	22 AUG
ESSOPAC	30 AUG
VR-57	31 AUG
NAVFACMETOFAC	06 SEP
NAVAL COASTAL WARFARE GROUP ONE (NCWG-1)	14 SEP
DEFENSE ENTERPRISE COMPUTER CENTER	21 SEP
FASOTRAGRUPAC	26 SEP
DEFENSE REUTILAZATION MARKETING OFFICE (DRMO)	04 OCT
AMPHIBIOUS CONSTRUCTION BATTALION ONE (ACB-1)	05 OCT
NAVAL BEACH GROUP ONE (NBG-1)	11 OCT
NAVAL UNDERSEA WARFARE CENTER (NUWC)	12 OCT
AIMD	18 OCT
NAVAL AIR FORCE PACIFIC FLEET	31 OCT

FOR ASSISTANCE, COMMENTS OR QUESTIONS PLEASE FEEL FREE TO CONTACT OUR SAFETY OFFICE LOCATED AT BLDG 678 RM 227

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The Navy Occupational Safety and Health Department of Naval Base Coronado publish SAF-T-LINES. It is an unofficial publication for dissemination of safety information. The intended purpose is to raise the awareness of safety by keeping NBC personnel knowledgeable about safety and health topics.